

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 July 2004 (08.07.2004)

PCT

(10) International Publication Number
WO 2004/057413 A1

(51) International Patent Classification⁷: G02F 1/01, 1/09

(21) International Application Number:
PCT/FI2003/000977

(22) International Filing Date:
19 December 2003 (19.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
20022249 20 December 2002 (20.12.2002) FI

(71) Applicant and

(72) Inventor: YE, Chun [CN/FI]; Rehjantie 4 as 3, FIN-87200
Kajaani (FI).

(74) Agent: INNOPAT LTD; P.O. Box 556, FIN-02151 Espoo
(FI).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

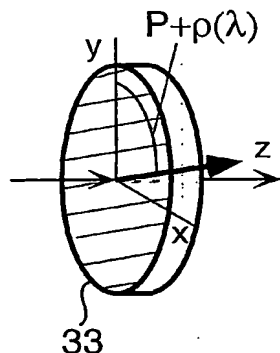
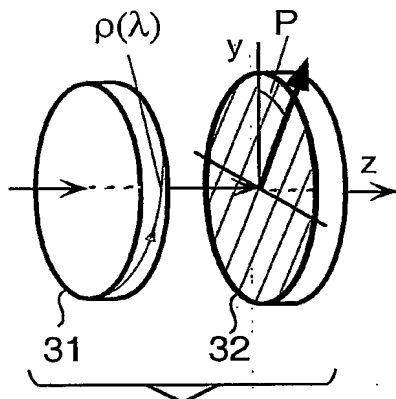
(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: DEVICE AND METHOD FOR AN OPTICAL TUNABLE POLARIZATION INTERFERENCE FILTER



(57) **Abstract:** The invention provides a tuner as constituent component for constructing a tunable or switchable spectral filter, including single and multiple stage filters and fitters without intermediate polarizer, over a wavelength range, which is characterized in that it comprises elements arranged in cascade along a light beam axis including a dispersive polarization rotator, having its rotation angle $p(\lambda)$ varying as a function of light wavelength λ over said wavelength range; an orientation-sensitive polarizing element, and means for rotating said polarizing element or/and varying said rotation angle $p(\lambda)$; whereby said polarization rotator and said polarizing element are arranged in series in said spectral filter along said light beam axis with said polarizing element oriented at a predetermined orientation angle related to the structure of said spectral filter, and said tuner is operated by rotating said polarizing element to change its orientation in said filter or/and by changing said rotation angle $p(\lambda)$. The invention is also concerned with said filters and furthermore tuning methods for tuning said filters.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.